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10/624,858	07/22/2003	Serguei Beloussov	2230.0340000	6544

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EXAMINER	
DOAN, DUC T	

ART UNIT	PAPER NUMBER
2188	

DATE MAILED: 03/13/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	10/624,858	BELOUSSOV ET AL.	
	Examiner	Art Unit	
	Duc T. Doan	2188	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *22 December 2005*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-54* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-54* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

DETAILED ACTION

Status of Claims

Applicant's arguments filed 12/22/05 have been fully considered with the result as follows,

Claims 1-54 are in the application.

Claims 1-54 are rejected.

Claim Rejection 35 USC 101

35 U.S.C. 101 reads as follows:

> Whoever invents or discovers any new and useful process, machine, manufacture, or composition of matter, or any new and useful improvement thereof, may obtain a patent therefor, subject to the conditions and requirements of this title.

Claim 54 rejected under 35 U.S.C. 101 because the claimed invention is directed to non-statutory subject matter.

Claim 54 recites " computer program product ....comprising a computer useable medium having computer program logic recorded thereon for controlling a processor, the computer program logic comprising". The claim appears to direct to a computer program which is a non-functional descriptive material, since there is no requirement in the claim for storing the program in a computer readable medium and to be executed by a computer. Since the claim is not limited to statutory subject matter and is therefore non-statutory.

All dependent claims are rejected as having the same deficiencies as the claims they depend from.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

Claims 1-3,7,22,24-26,30,35,38 rejected under 35 U.S.C. 103(a) as being unpatentable over Ofek et al (US 6598134)

As in claim 1, Ofek describes a computer system operable to provide backup copying of data without suspending an application program accessing the data, comprising: a storage device operable to store block data (Ofek's Fig 1: #14); a backup storage device operable to store block data (Ofek's Fig 1: #24 #17a-n); and an intermediate block data container operable to store block data (Ofek's Fig 1: #24 data map, cache memory #18), wherein the computer system is operable to copy a data block from the storage device into the intermediate block data container (Ofek's column 4 line 61 to column 5 line10); wherein the computer system is operable to manage the online data backup process by: compiling a list of data storage blocks located in the storage device that are subject to the data backup process, copying a data storage block to the backup storage device according to the list of data storage blocks (Ofek's column 4 line 58-65 describes an application, or user can configures corresponding data locations of the corresponding areas used in the moving operation from the first storage device to the second storage device);

suspending a write command that is directed to a data storage block that is subject to the data backup process but has not yet been copied, copying the data storage block that is the subject of a write command to the intermediate storage device, executing the write command and copying the data storage block from the intermediate storage device to the backup storage device (Ofek's Fig 3, column 9 lines 13-30 describes the write not full track operation in which write command is suspended, the data is read from the first storage device to the cache memory to merge with data in the in the write command and resuming the write operation; and write the data from cache to the second storage device, Ofek's column 9 lines 31-35). Although Ofek uses the migration as an example for transferring data blocks from the first storage device to the second storage device. The same technique is applied for other operation such as backing up data as suggested by Ofek's in column 1. One skilled in the art would have been motivated to do so, because by utilization of data transferring techniques and apparatus as taught by Ofek would advantageously providing data transferring with host data requests in a concurrent manner for these operations (Ofeks' column 1 line 45 to column 2 line 33).

As in claims 2-3, the claims recite wherein the intermediate block data container is located in a memory location that is external to the computer file system (claim 2); wherein the intermediate block data container is located in the storage device (claim 3); Ofek clearly describes information for data and metadata using in the data transferring operation are located for example in a cache memory (Fig 1: #24).

As in claim 7, the claim recites wherein the computer system is operable to: suspend a write command to the storage device during the data backup process if the intermediate block data container has reached a selected data capacity, and copy a selected amount of data from the

intermediate block data container to the backup storage device. The claim rejected based on the same rationale as in the rejection of claim 1. Ofek's further describes of using a threshold value to determine when to start data transferring of the copy procedure (Ofeks's column 17 lines 33-54).

As in claim 22, the claim recites upon receiving an indication that the intermediate block data container is close to overload, initiating a temporary slowdown of write operations by slowing down processes whose activity results in write operations into a non-backed-up area. The claim rejected based on the same rationale as in the rejection of claim 7. Ofek clearly describe of using a threshold value to multiplex the backup operation and the requests for data accessing. By using the multiplex scheme and the threshold value as taught by Ofek, it's obviously that the backup operation will not overflow the cache, and the data accessing process will be throttle back due to the multiplexing with the backup operation.

Claims24 rejected based on the same rationale as in claim 1.

Claim 25 rejected based on the same rationale as in claim 2.

Claim 26 rejected based on the same rationale as in claim 3.

Claim 30 rejected based on the same rationale as in claim 7.

Claim 35 rejected based on the same rationale as in claim 22.

As in claim 38, the claim recites wherein an order in which data blocks are scheduled for backup is changed based on information received from an external source. Ofek describes the data blocks to be transferred are scheduled in different order depending if the update write is to the full track write or not full track write, Ofek's column 9 lines 13-30

Claims 4-5,27-28,37 rejected under 35 U.S.C. 103(a) as being unpatentable over Ofek et al (US 6598134) as applied to claims 3,1, 26,25,24 respectively and in view of Rabii et al (US 2002/0032691).

As in claims 4-5, the claims recite wherein the intermediate block data container is a separate partition of the storage device (claim 4); wherein the intermediate block data container is a file within the file system (claim 5); Ofek does not describe the claims' detail of intermediate block data container in the storage device. However, Rabbi describes metadata structures to keep track of data objects that are transferring between two storage devices. The metadata structures can be implemented as files or directory structures in a standard file system (Rabbi's paragraph 55). Alternatively, the metadata structures can be implemented in a separate metadata partition (Rabbi's paragraph 38). It would have been obvious to one of ordinary skill in the art at the time of invention to maintain the metadata structures in cache and in disks as taught by Rabbi thereby allowing a quick access to their contents and advantageously stored in a non-volatile memory such as disk (Rabbi's paragraph 46).

Claims 27-28 rejected based on the same rationale as in claims 4-5 respectively.

As in claim 37, the claim recites wherein backed up data blocks are restored on the fly to a different storage device. The claim rejected based on the same rationale as in the rejection of claims 1-5. Furthermore, it's has been known the art that a logical file system can be automatic created, modified mounted in any number of physical storage devices using file accessing commands.

Claims 6,23,29,36 rejected under 35 U.S.C. 103(a) as being unpatentable over Ofek et al (US 6598134) as applied to claims 1,28,24 respectively and in view of Burton et al (US 6738865) and further in view of Hayter (US 6405294).

As in claim 6, the claim recites wherein the file system is further operable to write dirty pages to the storage device before initiating a data backup process. Ofek does not explicitly describe the claim's detail of writing pages to storage device. However, Burton describes a caching method and structures in which tracks or pages of data are staged from disk devices into caches (Burton's column 1 lines 10-33) and destaging dirty pages to disk devices using an LRU algorithm. It would have been obvious to one of ordinary skill in the art at the time of invention to add the page caching method as taught by Burton in Ofek to allow data of subsequence requests quickly returning to the requestors and thereby improve the throughput of the overall system (Burton's column 1 lines 11-33). Ofek and Burton do not describe the claim's aspect of destaging at the beginning of data backup process. However Hayter describes a migration method in which data in the cache is destaging to the disks at the beginning of the migration process. It would have been obvious to one of ordinary skill in the art at the time of invention to include the destaging method as taught by Hayter in Ofek's system. One skilled in the art would have been motivated to do so, because by destaging the data to disks before initiating migration process, it would ensures all source applications data updated are completed and stored in the non-volatile disks thereby the data integrity is further maintained for backup operation (Hayter's column 10 lines 55-65).

As in claim 23, the claim recites wherein a list of data blocks located in the storage device that are subject to the online data backup process includes all blocks of an underlying

storage device used by file system data and does not include free space blocks. The claim rejected based on the same rationale as in the rejection of claims 1 and 6. Ofek further describes the step of identifying only data blocks in a volume that need to be migrating and recording these blocks in a volume data map Fig 2: #60, column 14 lines 28-60. Thus Ofek clearly suggests that free space blocks are not belong to need migration type, obviously to reduce the size of data being copied (Ofek's column 14 lines 30-45).

Claim 29 rejected based on the same rationale as in the rejection of claim 6.

Claim 36 rejected based on the same rationale as in the rejection of claim 23.

Claims 8-10,21,31-34 rejected under 35 U.S.C. 103(a) as being unpatentable over Ofek et al (US 6598134) as applied to claim 1 and in view of Uemura et al (US 5720026).

As in claims 8-10, the claims recites wherein the file system driver translates a write request addressed to a file located in the storage device received from a user process into one or more block write operations (claim 8); wherein the file system driver transmits a write request received from an operating system process (claim 9); wherein the file system driver provides a data block number associated with a block in response to a write command directed to the data block during the online data backup process (claim 10). Ofek does not explicitly describe the claims' detail of the driver. However Uemura describes a pseudo device driver operating under control of an operating system capable of interpreting the blocks in the map table and sending them during the backup operation (Uemura's column 6 lines 10-35). It would have been obvious to one of ordinary skill in the art at the time of invention to include the pseudo device driver component as taught by Uemura in Ofek's system thereby allowing concurrent processing of

application program accessing data and backup operation while maintaining the consistency of data in the disk (Uemura's column 5 lines 33-55).

As in claim 21 the claim recites a file system driver operable to transmit a write request to write to the storage device; and a storage device program operable to read from the storage device and write to the storage device in block mode in response to the write request. Uemura describes the pseudo driver capable of function as in the block mode driver in column 6 lines 10-26. It would have been obvious to one of ordinary skill in the art at the time of invention to include the pseudo device driver component as taught by Uemura in Ofek's system thereby allowing concurrent processing of application program accessing data and backup operation while maintaining the consistency of data in the disk (Uemura's column 5 lines 33-55).

Claims 31-32 rejected based on the same rationale as in the rejection of claim 8.

Claim 33 rejected based on the same rationale as in the rejection of claim 9.

Claim 34 rejected based on the same rationale as in the rejection of claim 10.

Claims 11-15,17,20,39-43,45,48-49,51,53-54 rejected under 35 U.S.C. 103(a) as being unpatentable over Ofek et al (US 6598134) and in view of Uemura et al (US 5720026).

Claim 11 rejected based on the same rationale as in the rejection of claim 1 and 8.

Claims 12-13 rejected based on the same rationale as in the rejection of claim 11. Ofek's further describes the flag "need migration" in Fig 2: #60 that tracks the copy operation until it is completed. (Ofek's column 14 lines 45-60, column 16 lines 33-45).

As in claim 14, the claim recites informing the operating system driver that all of the data blocks subjected to the online data backup process have been copied to the backup storage devices. The claim rejected based on the same rationale as in the rejection of claims 11 and 13. Ofek's clearly describes in Fig 11: #211 of checking all migration flags and when they are clear, the migration process is done, Fig 11: #247.

Claims 15,43 rejected based on the same rationale as in the rejection of claim 10.

Claim 16 rejected based on the same rationale as in the rejection of claim 6.

Claims 17,45 rejected based on the same rationale as in the rejection of claim 2.

Claims 39,54 rejected based on the same rationale as in the rejection of claim 11.

Claim 40 rejected based on the same rationale as in the rejection of claim 39.

Claims 41,49 rejected based on the same rationale as in the rejection of claim 12.

Claim 42 rejected based on the same rationale as in the rejection of claim 13.

Claims 20,48 rejected based on the same rationale as in the rejection of claim 7.

Claim 51 rejected based on the same rationale as in the rejection of claim 14.

Claim 53 rejected based on the same rationale as in the rejection of claim 38.

Claims 16,44,50 rejected under 35 U.S.C. 103(a) as being unpatentable over Ofek et al (US 6598134), Uemura et al (US 5720026) as applied to claims 11,39,39 and in view of Burton et al (US 6738865) and further in view of Hayter (US 6405294).

Claims 16,44 rejected based on the same rationale as in the rejection of claim 6.

Claim 50 rejected based on the same rationale as in the rejection of claim 11 and 6.

Claims 18-19,46-47,52 rejected under 35 U.S.C. 103(a) as being unpatentable over Ofek et al (US 6598134), Uemura et al (US 5720026) as applied to claims 11,39 and in view of Rabii et al (US 2002/0032691).

Claims 18,46 rejected based on the same rationale as in the rejection of claim 4.

Claims 19,47 rejected based on the same rationale as in the rejection of claim 5.

Claim 52 rejected based on the same rationale as in the rejection of claim 37.

Conclusion

When responding to the office action, Applicant is advised to provide the examiner with the line numbers and page numbers in the application and/or references cited to assist examiner to locate the appropriate paragraphs.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Duc T. Doan whose telephone number is 571-272-4171. The examiner can normally be reached on M-F 8:00 AM 05:00 PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Mano Padmanabhan can be reached on 571-272-4210. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Mano Padmanabhan 3/2/06

MANO PADMANABHAN
SUPERVISORY PATENT EXAMINER